

<i>termvar</i> , <i>x</i>	term variable
<i>typevar</i> , <i>X</i> , <i>Y</i> , <i>Z</i>	type variable
<i>expr</i> , <i>lexpr</i>	place holders for labels and quantitative expressions
<i>nums</i> , <i>integer</i> , <i>double</i>	integers and doubles
<i>index</i> , <i>k</i>	

$quant, Q$	$::=$ $ \quad Q \rightarrow Q'$ $ \quad \text{Bool}$ $ \quad \text{Integer}$ $ \quad \text{Double}$	quantitative types
$qexpr, q$	$::=$ $ \quad \lambda x : Q. q$ $ \quad q_1 \ q_2$ $ \quad q_1 + q_2$ $ \quad q_1 - q_2$ $ \quad q_1 * q_2$ $ \quad q_1 / q_2$ $ \quad \text{true}$ $ \quad \text{false}$ $ \quad integer$ $ \quad double$	quantitative expressions
$label, L$	$::=$ $ \quad \text{String}$ $ \quad \text{Integer}$ $ \quad \text{Double}$	
$node, N, M$	$::=$ $ \quad \text{node } X : L, Q \text{ where } b$	nodes of the tree
$nodeBody, b$	$::=$ $ \quad \text{label} = lexpr, \text{data} = qexpr$	bodies of nodes
$rootBody, r$	$::=$ $ \quad \text{label} = lexpr, \text{struct} = atreeStruct$	bodies of root nodes
$atreeStruct, A, B, C, R, S, T$	$::=$ $ \quad X$ $ \quad A \sqcup B$ $ \quad A \otimes B$ $ \quad A \odot B$ $ \quad A \triangleright B$	attack tree structure nodes of the tree choice interacting parallel composition non-interacting parallel composition sequencing
$atree$	$::=$ $ \quad \text{root } X : L \text{ where } r$	attack tree
$cmdType$	$::=$ $ \quad \text{choice}$ $ \quad \text{ipara}$ $ \quad \text{nipara}$ $ \quad \text{seq}$	command types choice interacting parallel composition non-interacting parallel composition sequencing

$$\begin{array}{lcl}
 \textit{command} & ::= & \textit{commands} \\
 & | & \text{register } C \text{ cost-function } q\textit{expr}
 \end{array}$$